ORİJİNAL ARAŞTIRMA ORIGINAL RESEARCH

Nursing and Midwifery Students' Patient Safety Knowledge and Competencies in the Classroom and Clinical Settings and its Predictors: A Cross-Sectional Study

Hemşirelik ve Ebelik Öğrencilerinin Sınıf ve Klinik Ortamlarda Hasta Güvenliği Bilgi ve Yeterlilikleri ile Yordayıcıları: Kesitsel Bir Çalışma

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ABSTRACT Objective: To investigate nursing and midwifery students' patient safety knowledge and competencies in the classroom and clinical settings and its predictors. **Material and Methods:** The data of this cross-sectional study were collected from 318 nursing and midwifery students studying at the health sciences faculty of a state university between November and December 2021, using a descriptive information form and the Health Professional Education in Patient Safety Survey. Number, percentage, mean, standard deviation, minimum and maximum values were calculated in the data analysis, and independent-samples t test, one-way ANOVA, and regression analysis were used. **Results:** Nursing students' mean scores of the Health Professional Education in Patient Safety Survey were 3.88±0.50 in the classroom, 3.78±0.52 in the clinic and 4.05±0.48, 3.98±0.49 in midwifery students, respectively. Midwifery students' classroom and clinic mean scores were statistically higher than nursing students' mean scores (p=0.002; p=0.001). Moreover, there were statistically significant differences between nursing and midwifery students' mean scores in the 2 dimensions and all sub-dimensions except for the "Culture of safety" sub-dimension (p≤0.05). Finally, it was determined that the variables of students' age, grade, department and patient safety competency level affected students' patient safety knowledge and competencies. **Conclusion:** Nursing and midwifery students' perception of patient safety knowledge and competencies were found to be above average. In addition, nursing and midwifery students' perceptions of patient safety knowledge were higher than their perceptions of patient safety competencies.

Keywords: Patient safety; knowledge; competence; nursing students; midwifery students

ÖZET Amaç: Hemşirelik ve ebelik öğrencilerinin sınıf ve klinik ortamlarda hasta güvenliği bilgi ve yeterliliklerini ve yordayan faktörleri belirlemektir. **Gereç ve Yöntemler:** Bu kesitsel araştırmanın verileri, Kasım-Aralık 2021 tarihleri arasında bir devlet üniversitesinin sağlık bilimleri fakültesinde öğrenim gören 318 hemşirelik ve ebelik öğrencisinden Tanıtıcı Bilgi Formu ve Sağlık Profesyonellerinin Eğitiminde Hasta Güvenliği Ölçeği kullanılarak toplanmıştır. Verilerin analizinde sayı, yüzde, ortalama, standart sapma, minimum ve maksimum değerler hesaplanmış olup; bağımsız gruplarda t testi, tek yönlü varyans analizi ve regresyon analizi kullanılmıştır. **Bulgular:** Hemşirelik öğrencilerinin Sağlık Profesyonellerinin Eğitiminde Hasta Güvenliği Ölçeği puan ortalaması sınıf ortamı boyutunda 3,88±0,50, klinik ortam boyutunda 3,78±0,52 olup, ebelik öğrencilerinin ise sırasıyla 4,05±0,48 ve 3,98±0,49'du. Ebelik öğrencilerinin sınıf ortamı ve klinik ortam puan ortalamaları, hemşirelik öğrencilerinin puan ortalamalarına göre istatistiksel olarak daha yüksek bulundu (p=0,002; p=0,001). Dahası, sınıf ortamının tüm alt boyutlarında ve klinik ortamda "güvenlik kültürü" alt boyutu hariç diğer alt boyutlarda hemşirelik ve ebelik öğrencilerinin puan ortalamaları arasında istatistiksel olarak anlamlı farklılıklar belirlendi (p≤0,05). Son olarak öğrencilerin yaş, akademik not ortalaması, öğrenim görülen bölüm ve hasta güvenliği yeterlilik düzeyi değişkenlerinin öğrencilerin hasta güvenliği bilgi ve yeterliliğini etkilediği saptandı. **Sonuç:** Hemşirelik ve ebelik öğrencilerinin hasta güvenliği bilgi ve yeterlilik algısının ortalamanın üzerinde olduğu saptanmıştır. Ayrıca hemşirelik ve ebelik öğrencilerinin hasta güvenliği bilgisi algılarının, hasta güvenliği yeterliliği algılarından daha yüksek olduğu belirlenmiştir.

Anahtar Kelimeler: Hasta güvenliği; bilgi; yeterlilik; hemşirelik öğrencileri; ebelik öğrencileri

Patient safety, one of the critical indicators of providing qualified and high-quality health care services, is described as the "prevention of harm to patients."[1,2] The patient safety concept began to be considered in the United States in the 1900s, based on the non-harm to the patient principle, and regulations

began to be made in our country in 2003.[2,3] The World Health Organization (WHO) reported that one out of every 10 patients is harmed by medical errors, 50% of these harms are preventable, and medical errors due to patient care are the leading cause of death and disability globally.[4,5] WHO even reported that these harms were not intentional, but caused by the complexity of health care services.[4] Moreover, it has been reported that these harms lead to injury, complications, recurrence or disruption of diagnosis and treatment, loss of confidence in healthcare personnel, increased hospital stay, and deaths in patients.[6,7] Therefore, patient safety is pivotal for maintaining quality health care.

Establishing a patient safety culture among healthcare professionals is critical for the applicability and sustainability of patient safety. Patient safety culture is possible by developing knowledge, attitudes and behaviors related to patient safety throughout the professional life, starting from the health education process.[6,7] When studies on patient safety culture are examined, it has been reported that patient safety training given to healthcare professionals positively affects patient safety knowledge, attitudes and skills.[8,9] In addition, the WHO has included nurses, midwives, and other health professionals in the "WHO Patient Safety Curriculum for Medical Schools" guideline that launched for medical students.[10] Therefore, as recommended by WHO, it is pivotal that healthcare professionals should be educated in line with this guideline on patient safety during undergraduate education. In addition, students' patient safety knowledge and competencies should be periodically evaluated by monitoring the education results of students.[11] Nurses and midwives are involved in health care services more than other healthcare professionals and have more contact with patients due to their role as caregivers.[11,12] Nursing and midwifery students also actively participate in patient care under the supervision of a mentor in clinical practice during their undergraduate education. However, reasons such as lack of experience and knowledge in clinical practice can cause students to experience anxiety and make medical errors.[7] In studies, it has been reported that nursing students' patient safety knowledge is insufficient.[7,12] Also, in studies

conducted with midwifery students, most of the students received training on patient safety and medical errors, but they considered themselves insufficient in patient safety.[6,13] When the literature is examined, studies conducted with students on patient safety are mostly carried out in the samples of nursing students or nursing and medical students.[7,11,12,14] Otherwise, the studies conducted with midwifery students mostly were carried out only in the sample of midwifery students.[6,13,15] In addition, international studies on patient safety conducted with nursing and midwifery students are also limited, and generally, comparison studies were conducted in the sample of nursing students or between countries.[16,17] Therefore, determining nursing and midwifery students' patient safety knowledge and competencies and its predicting factors will significantly contribute to the literature. This study was performed to investigate nursing and midwifery students' patient safety knowledge and competencies in the classroom and clinical settings and its predictors.

MATERIAL AND METHODS

STUDY DESIGN AND SAMPLE

This cross-sectional study population consisted of 3rd and 4th grade nursing and midwifery students (n=534) of the health sciences faculty of a state university. All students from the 3rd and 4th grades who volunteered to participate in the study were included by using the convenience sampling method. Since the Health Professional Education in Patient Safety Survey (H-PEPSS$_{TR}$) used in current study evaluated students' patient safety knowledge and competencies in the classroom and clinic, 1st and 2nd grade nursing and midwifery students who did not have sufficient clinical practice were not included in the study. Thus, the study sample was formed of 318 nursing and midwifery students. The return rate was 59.6%.

DATA COLLECTION AND INSTRUMENTS

This study data were collected between November and December 2021 with the Introductory Information Form prepared according to the literature and H-PEPSS$_{TR}$.[6,7,11] Firstly, students were informed by going to classes before class hours about the study

aim and the data collection tool. Oral and written approvals were obtained from students who confirmed to attend in this study, and the data collection tool was distributed to the students in a closed envelope. Students were given 15-20 minutes to fill out the data collection tool, and then the filled data collection tools were taken back from the students.

Introductory Information Form

This form consisted of 12 questions, including 6 questions for students' demographic characteristics, 4 questions on patient safety, and 2 questions for patient safety knowledge and competency level. In the 2 questions, students were asked to evaluate their patient safety knowledge level on a visual analog scale as "0-completely insufficient" and "10-completely sufficient." Likewise, they were asked to evaluate their patient safety competency level on a visual analog scale of 10 as a separate question in a similar way.

H-PEPSS$_{TR}$

Ginsburg et al. developed this survey, and Taskiran et al. performed Turkish version' psychometric testing.[11,18] The survey consists of 23 items, measuring the perception of patient safety knowledge learned in the classroom setting and patient safety competencies improved in the clinical setting, 2 dimensions as "classroom setting" and "clinical setting" and 6 sub-dimensions as "Working in a team with other health professionals (6 items), Communicating effectively (3 items), Managing safety risks (3 items), Understanding human and environmental factors (3 items), Recognizing, responding to and disclosing adverse events and close calls (4 items) and Culture of safety (4 items)." The 5-point Likert type scale is evaluated between "strongly disagree-1 point and strongly agree-5 points." In addition, there is an "don't know" option on the scale, but this expression is scored as missing data or given a "0 point" and is not included in the evaluation. On the H-PEPSS$_{TR}$, students were asked to answer the items of classroom setting by considering their patient safety knowledge they learned in theoretical lessons and the items of clinical setting by considering their patient safety competencies they improved in clinical practices. As the participants' scores from the "classroom setting" dimension and its sub-dimensions increase, the per-

ceptions of patient safety knowledge increase. As the participants' scores from the "clinical setting" dimension and its sub-dimensions increase, the perceptions of patient safety competencies increase. For both dimensions, Taskiran et al. found Cronbach alpha to be 0.97, and it was found as 0.95 in this study.[11]

DATA ANALYSIS

Study data were analyzed with the IBM SPSS Statistics 22 (licensed by Ondokuz Mayis University) software. All data were evaluated with Kolmogorov-Smirnov for compliance with the normal distribution. While analyzing the data, descriptive analyzes (frequency, percentage, mean scores, etc.) were used to determine students' demographic characteristics and scale scores. Parametric comparative analyzes (independent samples t-test and one-way ANOVA) were used to compare the measurements according to demographic characteristics. In addition, multiple linear regression was performed to determine predicting factors. Data were analyzed at the 5% level of significance.

ETHICAL CONSIDERATIONS

Institutional permission from the relevant departments and ethical approval (date: November 26, 2021; no: 2021-912) from the Ethic Committee of Ondokuz Mayıs University were obtained. Verbal and written consent was obtained from the students participating in the study, and permission was obtained from the corresponding author to use the H-PEPSS$_{TR}$. In addition, the Declaration of Helsinki principles were considered in this study.

RESULTS

Research findings are presented under 4 headings.

INTRODUCTORY INFORMATION OF NURSING AND MIDWIFERY STUDENTS

It was determined that nursing and midwifery students mainly were 21 years old and under, women and third grade. Nursing students mainly stated that they received lessons related to patient safety during the undergraduate education (82.0%) and found the lessons sufficient (77.5%). Likewise, midwifery students mostly reported that they received patient safety

lessons during their undergraduate education (90.7%) and found the lessons sufficient (82.2%). Nursing students' mean patient safety knowledge level was found to be 6.76±1.63, and mean patient safety competency level was 6.71±1.65, while midwifery students' means were found to be 6.64±1.60 and 6.57±1.63, respectively (Table 1).

NURSING AND MIDWIFERY STUDENTS' H-PEPSS$_{TR}$ SCORES

In the classroom setting dimension, nursing students' mean score was found to be 3.88±0.50 and that of midwifery students as 4.05±0.48. In the classroom setting dimension, nursing students (4.02±0.64) and midwifery students (4.21±0.61) got the highest scores in the "Communicating effectively" sub-dimension. In the clinical setting dimension, nursing students' mean score was 3.78±0.52 and midwifery students' score was 3.98±0.49. Also in the clinical setting di-

mension, nursing students (3.92±0.60) and midwifery students (4.14±0.61) got the highest scores in the "Communicating effectively" sub-dimension. There were statistically significant differences between nursing and midwifery students' mean scores in the 2 dimensions and all sub-dimensions except for the "Culture of safety" sub-dimension (p≤0.05; Table 2).

NURSING AND MIDWIFERY STUDENTS' H-PEPSS$_{TR}$ SCORES ACCORDING TO THEIR INDIVIDUAL CHARACTERISTICS

In the dimensions of classroom and clinical settings, statistically significant differences were found according to students' department and patient safety training status during the undergraduate education (p≤0.05). Accordingly, midwifery students' mean scores of classroom and clinical settings were statistically higher than nursing students' mean scores (p=0.002; p=0.001). In addition, classroom and clin-

TABLE 1: Introductory information of nursing and midwifery students.					
		Nursing (n=189)		Midwifery (n=129)	
Variables		n	%	n	%
Age groups	≤21 years	128	67.7	75	58.1
	≥22 years	61	32.3	54	41.9
Gender	Female	155	82	129	100
	Male	34	18	0	0
Graduated high school	Health vocational high school	25	13.2	21	16.3
	Anatolian high school	121	64	76	58.9
	Science high school	43	22.8	32	24.8
Educational level	3rd class	98	51.9	66	51.2
	4th class	91	48.1	63	48.8
Considering patient safety an important issue	Yes	188	99.5	129	100
	No	1	0.5	0	0
Patient safety training status	Yes	155	82	117	90.7
	No	34	18	12	9.3
Finding sufficient the training received	Yes	134	77.5	97	82.2
	No	39	22.5	21	17.8
Needing additional training on patient safety	Yes	57	50	15	57.7
	No	57	50	11	42.3
		Nursing (n=189)		Midwifery (n=129)	
Variables		M±SD	Minimum-maksimum	M±SD	Minimum-maksimum
Age		21.46±2.18	19-40	21.47±1.55	19-28
Grade point average (GPA)		3.11±0.45	2-4	2.93±0.40	1.30-3.82
Patient safety knowledge level		6.76±1.63	0-10	6.64±1.60	2-10
Patient safety competency level		6.71±1.65	0-10	6.57±1.63	2-10

M: Mean; SD: Standard deviation; n: Frequency; %: Percentage.

TABLE 2: H-PEPSS$_{TR}$ scores of nursing and midwifery students.

Sub-dimensions	Classroom setting		Test and significance		Clinical setting		Test and significance	
	Nursing M±SD	Midwifery M±SD	t / p value	α	Nursing M±SD	Midwifery M±SD	t / p value	α
Working in a team with other health professionals	3.88±0.57	4.07±0.53	t:-2.884 p:0.004**	0.854	3.81±0.58	4.01±0.57	t:-3.003 p:0.003**	0.854
Communicating effectively	4.02±0.64	4.21±0.61	t:-2.576 p:0.010**	0.844	3.92±0.60	4.14±0.61	t:-3.135 p:0.002**	0.808
Managing safety risks	3.81±0.64	4.00±0.66	t:-2.566 p:0.011*	0.851	3.70±0.68	3.97±0.68	t:-3.332 p:0.001***	0.877
Understanding human and environmental factors	3.92±0.59	4.10±0.68	t:-2.473 p:0.014*	0.862	3.79±0.62	3.99±0.64	t:-2.843 p:0.005**	0.831
Recognizing, responding to and disclosing adverse events and close calls	3.80±0.63	3.99±0.67	t:-2.439 p:0.015*	0.874	3.68±0.66	3.91±0.67	t:-2.926 p:0.004**	0.858
Culture of safety	3.86±0.58	4.00±0.62	t:-2.040 p:0.042*	0.824	3.77±0.63	3.90±0.61	t:-1.725 p:0.086	0.815
Total	3.88±0.50	4.05±0.48	t:-3.139 p:0.002**	0.952	3.78±0.52	3.98±0.49	t:-3.401 p:0.001***	0.953

*p<0.05; **p<0.01; ***p<0.001; M: mean; SD: Standard deviation; α: Cronbach's alpha; t: Independent samples t-test.

ical settings mean scores of those who received patient safety lessons during their undergraduate education were higher than those who did not (p=0.019; p=0.035; Table 3).

PREDICTING FACTORS OF NURSING AND MIDWIFERY STUDENTS' PATIENT SAFETY KNOWLEDGE AND COMPETENCIES

The predictors of nursing and midwifery students' patient safety knowledge and competencies were investigated using the enter method of regression analysis (Table 4). The Durbin-Watson and Variance Inflation Factor were used to evaluate autocorrelation and multicollinearity and found that the essential requirements of regression analysis were met. Two models were formed. Students' variables of age, Grade Point Average, department and patient safety competency level had a significant effect on the classroom setting score in the first model (p≤0.05). In this model, students' variables together explained 21% of the variance (F=14.990; p<0.001; adj. R^2=0.210). In the second model, students' variables of department and patient safety competency level had a significant effect on the clinical setting score (p≤0.05). Students' variables together explained 20.3% of the variance in the model (F=14.432; p≤0.001; adj. R^2=0.203).

DISCUSSION

It is essential that healthcare students receive patient safety training both in classroom and clinical environment to provide safe patient care when they start their profession. In addition, to optimize students' patient safety knowledge and competencies, this patient safety training needs to be assessed and improved periodically. This assessment is an essential component of competency-based training and should be used to obtain feedback. Thus, it is necessary to evaluate students' training with valid and reliable instruments.[19,20] Therefore, in this study,

Variables		n	Classroom setting M±SD	Clinical setting M±SD
Age groups	≤21 years	202	3.97±0.47	3.85±0.50
	≥22 years	115	3.92±0.55	3.89±0.55
	Test and significance		t:0.861	t:-0.766
			p:0.390	p:0.444
Gender	Female	283	3.97±0.46	3.87±0.47
	Male	34	3.78±0.76	3.77±0.81
	Test and significance		t:1.377	t:0.705
			p:0.177	p:0.485
Educational level	3rd class	164	3.96±0.48	3.83±0.50
	4th class	153	3.94±0.53	3.90±0.54
	Test and significance		t:0.419	t:-1.139
			p:0.676	p:0.255
Department	Nursing	188	3.88±0.50	3.78±0.52
	Midwifery	129	4.05±0.48	3.98±0.49
	Test and significance		t:-3.139	t:-3.401
			p:0.002**	p:0.001**
Graduated high school	Health vocational high school	46	3.97±0.46	3.90±0.42
	Anatolian high school	197	3.95±0.53	3.86±0.55
	Science high school	74	3.94±0.46	3.86±0.48
	Test and significance		F:0.037	F:0.113
			p:0.964	p:0.893
Patient safety training status	Yes	272	3.97±0.51	3.89±0.52
	No	45	3.78±0.42	3.71±0.46
	Test and significance		t:2.365	t:2.117
			p:0.019*	p:0.035*

TABLE 3: H-PEPSS$_{TR}$ scores of nursing and midwifery students according to their individual characteristics.

*$p < 0.05$; **$p < 0.01$; n: Frequency; M: Mean; SD: Standard deviation; F: One Way ANOVA; t: Independent samples t-test.

nursing and midwifery students' patient safety knowledge and competencies learned in the classroom and clinical environment were evaluated. Since previous studies on this subject were mostly conducted with nursing students, this study is important because it is the first study performed with nursing and midwifery students.

NURSING AND MIDWIFERY STUDENTS' H-PEPSS$_{TR}$ SCORES

In the classroom and clinical setting mean scores, it was determined that patient safety knowledge and competencies of students from both departments were above the average. According to this result, it can be said that the students are well-educated about patient safety in both classroom and clinical environments. Similarly, Toygar et al. reported patient safety knowledge and competencies scores of nursing stu-

dents above the average.[12] In another study, patient safety knowledge and competencies scores of Cypriot and Greek nursing students were found above the average.[16] In a study performed with midwifery students, it was stated that the students found themselves sufficient in patient safety.[13] According to this, it is seen that the students' patient safety knowledge and competencies perception is above the average in parallel with previous studies. In addition, considering that previous studies were mostly carried out before the pandemic process, it is concluded with this study that online education during the pandemic process does not make a difference in students' perception of patient safety knowledge and competencies.

Nursing and midwifery students got the highest score from the "Communicating effectively" sub-dimension in both classroom and clinical settings. This indicates that students have more self-confidence in

Model		B	Standart error	β	t	p value	Durbin Watson	VIF
TABLE 4: Predictors of nursing and midwifery students' patient safety knowledge and competencies.								
1	(Constant) H-PEPSS$_{TR}$ classroom setting	2.853	0.421		6.780	0.000		
	Age	-0.030	0.013	-0.116	-2.243	0.026*		1.072
	GPA	0.148	0.061	0.129	2.430	0.016*		1.123
	Patient safety knowledge level	0.059	0.032	0.189	1.816	0.070	1.404	4.349
	Patient safety competency level	0.076	0.031	0.246	2.403	0.017*		4.199
	Department	0.229	0.053	0.225	4.343	0.000***		1.073
	Patient safety training status	0.056	0.078	0.039	0.716	0.475		1.172
	R^2=0.225; Adj. R^2=0.210; F=14.990; p=0.000***							
2	(Constant) H-PEPSS$_{TR}$ Clinical setting	2.524	0.435		5.800	0.000		
	Age	-0.007	0.014	-0.028	-0.535	0.593		1.072
	GPA	0.041	0.063	0.034	0.647	0.518		1.123
	Patient safety knowledge level	0.035	0.034	0.111	1.056	0.292	1.000	4.349
	Patient safety competency level	0.108	0.033	0.343	3.332	0.001***		4.199
	Department	0.232	0.055	0.221	4.255	0.000***		1.073
	Patient safety training status	0.275	0.080	0.051	0.935	0.350		1.172
	R^2=0.218; Adj. R^2=0.203; F=14.432; p=0.000***							

*p≤0.05; **p≤0.01; ***p≤0.001; Durbin Watson: autocorrelation coefficient; VIF: Variance Inflation Factor; R2: coefficient of determination; Adj. R2: Adjusted coefficient of determination; B: Non-standardized beta value; β: Standardized beta value; t: Significance of variable; F: Significance of variable; GPA: Grade Point Average.

sociocultural aspects of patient safety. Similarly, Taskiran et al. and Sümen et al. reported that nursing students got the highest score in the "Communicating effectively" sub-dimension.[11,21] Nursing students got the lowest score in the "Recognizing, responding to and disclosing adverse events and close calls" sub-dimension and midwifery students in the "Culture of safety" sub-dimension. Similarly, in previous studies, it was also reported that nursing students got the lowest score in the same sub-dimension.[11,22,23] Nursing students are unconfident in their clinical experience, so they may have difficulty examining unsafe practices.[24] Moreover, students may be affected by the institution's culture where they do clinical practice, and they may be in a dilemma about reporting errors. Instructors are critical for encouraging and supervising students about patient safety and error reporting. They should form a non-punitive and constructive environment for students and guide them to report errors and adverse events.[14] Otherwise, the study result reveals that students have little self-confidence in technical aspects of patient safety. Considering that studies in different cultures mostly concluded that students value technical aspects rather than sociocultural aspects of patient safety in the classroom and clinical settings, this study's finding can be a positive result for Turkish culture.[14,16,25]

Nursing and midwifery students' classroom setting score was found to be higher than the clinical setting score. Similarly, in the study of Dimitriadou et al., students' patient safety knowledge was significantly higher in the classroom compared to the clinic.[16] The fact that students' perception of patient safety knowledge is higher than the perception of patient safety competence is similar to most previous studies.[11,14,21,25-28] This result re-emphasizes the gap between theory and practice in line with the literature. Thus, the importance of cooperation between the classroom and clinical environment re-emerges.

NURSING AND MIDWIFERY STUDENTS' H-PEPSS$_{TR}$ SCORES ACCORDING TO THEIR INDIVIDUAL CHARACTERISTICS

When nursing and midwifery students' patient safety knowledge and competence mean scores were examined according to their personal characteristics, classroom and clinical setting mean scores of those who received training on patient safety during their undergraduate education were higher than those who did not. This result shows that education improves

knowledge and is also meaningful for developing skills in practice. It is an expected result that students' awareness who have received training increases, so their perception of patient safety knowledge and competence increases. In many previous studies, it is stated that education brings about positive changes in knowledge.[8,28,29]

PREDICTING FACTORS OF NURSING AND MIDWIFERY STUDENTS' PATIENT SAFETY KNOWLEDGE AND COMPETENCIES

Regression analysis was performed to investigate the predictors of students' patient safety knowledge and competencies. As a result, students' patient safety knowledge was affected by variables of age, grade point average, department, and patient safety competency level. Students' patient safety competencies were affected by variables of department and patient safety competency level. According to the department, it was determined that midwifery students' mean scores in all sub-dimensions and total of the classroom setting dimension was higher than that of nursing students. In the clinical setting dimension, midwifery students' mean scores were higher in the other sub-dimensions and total, except for the "culture of safety" sub-dimension. This study finding can be explained by the differences in the structure of curriculum, syllabus and study programs of 2 departments, although with limited discussion due to lack of a study on this subject before. In addition, this difference may be due to the difference in students' number per instructor in the nursing and midwifery departments. Student number per instructor in the midwifery department is less, which is a pivotal factor affecting the quality of students' education. Other possible reasons may be that the clinical guidance model used is different, educators have different expertise in patient safety, or students have different interests in the subject.

According to age, students' patient safety knowledge decreases as their age increases. This can be explained by students spending more time in the clinical environment in their final years, and theoretical lessons' hours decrease. In addition, as students' grade point average increases, their patient safety knowledge also increases. This can be explained by

students' academic success. Similarly, Sümen et al. found that nursing students with 3 or above academic success have high patient safety knowledge.[21] This situation suggests that patient safety knowledge and competencies should be examined in more detail according to students' academic success. Students who perceive themselves at a high level in patient safety competency also have high scores of patient safety knowledge and competencies from the survey. This situation can be explained by students' self-awareness about the subject, and it is an expected result that students with high awareness have also high knowledge and competencies. Likewise, Toygar et al. also obtained a similar result.[12]

LIMITATIONS

The study was carried out with nursing and midwifery students studying in a single health sciences faculty, and the generalizability of study results is limited to the students of this faculty. Research data were collected with a self-report questionnaire. Therefore, students may have over-or under-answered questionnaire items, and study results are limited to the individual feedback of students. Finally, the items in the clinical setting do not refer to a certain clinic, so students' perception of patient safety competence only provides a general aspect.

CONCLUSION

As a result, nursing and midwifery students' perception of patient safety knowledge and competence were above the average. In addition, nursing and midwifery students' perceptions of patient safety knowledge were higher than their perceptions of patient safety competence. This result re-emphasizes the gap between theory and practice and the importance of cooperation between the classroom and clinical environment re-emerges. Moreover, the results show that students have more self-confidence in sociocultural aspects of patient safety and less confidence in technical aspects. Finally, predictors of nursing and midwifery students' patient safety knowledge and competencies were determined as students' age, grade point average, department, and patient safety competency level. This study results can significantly contribute to determining the deficiencies of nursing

and midwifery students in this field, creating an action plan to overcome these deficiencies and developing the departments' curriculum in this direction. But more research is needed to understand better how to design, teach, and deliver patient safety education in each department's curriculum.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Gülcan Taşkıran Eskici;* ***Design:*** *Gülcan Taşkıran Eskici;* ***Control/Supervision:*** *Gülcan Taşkıran Eskici;* ***Data Collection and/or Processing:*** *Gülcan Taşkıran Eskici, Yasemin Sökmen;* ***Analysis and/or Interpretation:*** *Gülcan Taşkıran Eskici;* ***Literature Review:*** *Yasemin Sökmen, Gülcan Taşkıran Eskici;* ***Writing the Article:*** *Gülcan Taşkıran Eskici, Yasemin Sökmen;* ***Critical Review:*** *Gülcan Taşkıran Eskici, Yasemin Sökmen;* ***References and Fundings:*** *Gülcan Taşkıran Eskici, Yasemin Sökmen.*

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